The description of the female of *Illiberis (Illiberis) ellenae* Alberti, 1954 (Lepidoptera: Zygaenidae, Procridinae)

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Abstract: The hitherto unknown female of *Illiberis (Illiberis) ellenae* Alberti, 1954, is described. Bionomic notes for this species are provided.

Beschreibung des Weibchens von *Illiberis (Illiberis) ellenae* Alberti, 1954 (Lepidoptera: Zygaenidae, Procridinae)

Zusammenfassung: Das bislang unbekannte Weibchen von *Illiberis (Illiberis) ellenae* Alberti, 1954 wird beschrieben. Einige Angaben zur Biologie der Art ergänzen die Ausführungen.

Introduction

Illiberis (Illiberis) ellenae Alberti, 1954, was described from 3 ♂♂ (holotype, two paratypes) originating from China and deposited in Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn. The holotype has three labels: "A-tun-tse (N. Yünnan)/Talsohle ca. 3000 m/18. v. 1937. H. Höne" (printed, grey paper); "{Holotypus/abgebildet/Alberti 1952}" (upperside) (handwritten by Alberti), "{*Illiberis/höneana* [sic] ♂/ Alberti 1952}" (underside) (handwritten by Alberti) (yellowish white paper); "{Holo-}/Typus" (printed, with handwritten inscription by Alberti, red paper). In citing the pin-label data, the symbol '/' denotes the end of a line; handwritten inscriptions are listed in brackets {}.

Alberti (1954: 235) provided the following diagnosis:

> "Der Gattin des Entdeckers freundlichst gewidmet.
>
> Beschrieben nach 3 ♂♂ von „A-tun-tse (N.-Yünnan) Talsohle ca. 3000 m 13.–19. v. 1937". Holotypus in coll. Dr. Höne.
>
> Vdfll. 10–10,5 mm. Ganz ähnlich *hönei,* Flügel etwas dichter beschuppt als bei dieser.
>
> Valve ohne den feinen Mitteldorn am Unterrand, dieser bauchig ausgeweitet, am Ende ebenfalls mit nach unten abgebogenem Dornfortsatz sowie schmalem Fortsatz des Oberrandes der Valve. Der schmächtige Aedoeagus mit ganz feinem nadelformigem Dorn, wie ich ihn bei den vorigen Arten nicht finden konnte."

As can be seen from Alberti's original label, he intended to name this species as "*Illiberis höneana*" [sic]; however, it was described as *Illiberis ellenae* in honour of the wife of H. Höne.

Hitherto the ♀ of *I. ellenae* was unknown.

In 2007 the Italian lepidopterist Enrico Gallo (Genova) sent a ♀ of an *Illiberis* species to G. M. Tarmann for identification. This specimen had been taken together with a second ♀ in 1998, not far from the type locality of *I. ellenae*. E. Gallo suggested that these two ♀♀ could be *I. ellenae,* but as he had found only ♀♀ and *I. ellenae* was described from ♂♂ it was impossible to determine the ♀♀. On 4.–6. vi. 2007, J. Klír collected a series of ♂♂ and ♀♀ of an *Illiberis* species at 3000 m 20 km west of De-quin, which is the current name of the former A-tun-tse that is situated in the upper Mekong valley in the Chinese province of Yunnan. One ♂ and two ♀♀ were sent to K. A. Efetov for identification (Figs. 1, 2).

A comparison of the ♂ genitalia of the specimen collected by J. Klír with those of the holotype of *I. ellenae* showed that the two specimens are conspecific. Moreover, a comparison of the genitalia of one of the ♀♀ collected by E. Gallo (sent to G. M. Tarmann) with those of specimens collected by J. Klír showed them to be conspecific. Based on this information, the hitherto unknown female of *I. ellenae* can now be described.

Description

Habitus of ♂ and ♀ similar.

♀ (Fig. 1). Length of body 8.3–8.4 mm; length of forewing 9.8–9.9 mm, breadth 3.6–3.7 mm; length of hindwing 6.8–7.0 mm, breadth 3.2 mm; length of antenna 5.3–5.4 mm. Frons and occiput black. Antenna covered with black scales, with bluish sheen, shortly bipectinate, antennal shaft tapering towards and pointed at apex, length of pectination longest in middle part of antenna (0.2 mm), number of segments 39, ratio of breadth of 4th segment from apex to breadth of 15th segment 0.7–0.8. Proboscis blackish brown, well developed. Tegulae and patagia black. Thorax covered with black hair-like scales. Wings semitransparent, veins black, forewing and hindwing upper- and underside grey; fringe black. Veins R_4 and R_5 of forewing arising from cell at one point (connate). Upperside of forewing covered with bidentate scales (ratio of length to breadth 3–10), scales on main surface of forewing and especially in cell arranged to form an acute angle with plane of wing. Anterior (costal) part of upperside of hindwing, including cell, covered with narrow ovoid scales (ratio of length to breadth 3–4), arranged horizontally relative to plane of wing; posterior (dorsal) part of upperside of hindwing covered with broad, shortly bidentate scales (ratio of length to breadth 1.5–2.5), arranged vertically relative to plane of wing. Legs black, thickly covered with scales, foreleg with long tibial epiphysis, hind tibia with one pair of short spurs (apical). Abdomen black, thickly covered with scales.

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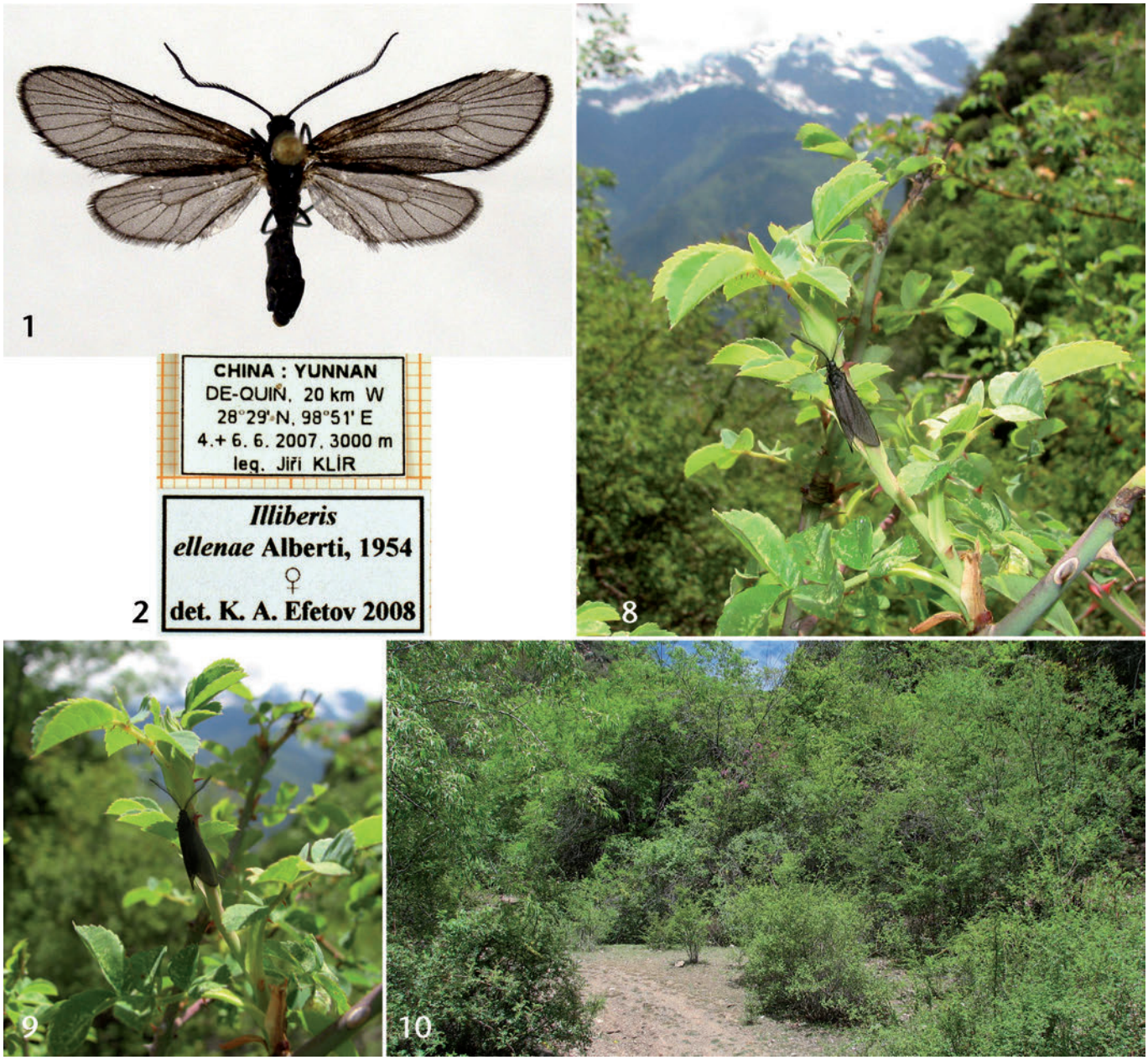

Figs. 1, 2, 8–10: *Illiberis ellenae* Alberti, 1954. **Fig. 1:** ♀. **Fig. 2:** Pin-labels of ♀ (photos: K. A. Efetov). — **Fig. 8:** ♂ on *Rosa* sp.; **Fig. 9:** ♂ resting on *Rosa* sp., usual position in shadow. **Fig. 10:** biotope (photos: J. Klír).

Genitalia (Figs. 5, 6). Anal papillae ovoid, covered with numerous relatively long setae. Eighth sternite narrow, strongly sclerotized. Ostium broad, slit-shaped; antrum goblet-shaped with weakly sclerotized dorsal part and translucent ventral wall. Ductus bursae very narrow, translucent, with strongly folded walls. Corpus bursae double, proximal part longer, inner surface covered with numerous sclerotized spicules, distal part smaller, without spicules. One specimen with short lateral appendix between proximal and distal parts of corpus bursae.

Differential diagnosis

Illiberis ellenae is closely related to *Illiberis hoenei* Alberti, 1954 (also described from China, northern Yunnan) but can be differentiated by its genitalia morphology. In the males the valva of *I. ellenae* (Fig. 3) is shorter and broader than that of *I. hoenei* (Fig. 4). The process on the ventral margin of the sacculus is absent in *I. ellenae* whereas a short pointed process is present in that position in *I. hoenei*. In spite of the original description of *I. ellenae* (Alberti mentioned a thin needle-shaped cornutus in the ♂, see above), there is no cornutus in the vesica of the phallus (aedeagus) in the ♂ holotype of *I. ellenae* (dissected by the K. A. Efetov) as well as in the ♂ collected by J. Klír. Thus, there are no relevant differences between the phallus of *I. ellenae* and that of *I. hoenei*. In the ♀ genitalia of *I. hoenei* (Fig. 7), a dorso-lateral appendix of the antrum is present, but this is absent in *I. ellenae* (Figs. 5, 6). The proximal part of the corpus bursae in *I. ellenae* is completely covered with small spicules, but in *I. hoenei* the lateral part of the corpus bursae (at the side where the ductus seminalis arises) lacks such spicules.

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Fig. 3: *Illiberis ellenae* Alberti, 1954, genitalia of holotype ♂. **Fig. 4:** *Illiberis hoenei* Alberti, 1954, genitalia of holotype ♂ (specimen with printed label on yellow paper: "Li-kiang ca. 2000 m/Prov. Nord-Yuennan/31. v. 1934. H. Höne"). **Figs. 5, 6:** *I. ellenae,* ♀ genitalia. **Fig. 5:** "China: Yunnan/ De-Quin, 20 km W/28°29′ N, 98°51′ E/4. + 6. vi. 2007, 3000 m/leg. Jiří Klíř". **Fig. 6:** "China, NW Yunnan,/Mekong valley, 3000 m,/19 km N Dêqên/ 28°28,90′ N/98°51,43′ E/10. vi. 1998, E. Gallo leg." **Fig. 7:** *I. hoenei,* genitalia of paratype ♀ (specimen with printed label on yellow paper: "Li-kiang ca. 2000 m/Prov. Nord-Yuennan/1. vi. 1934. H. Höne"). — Scale bars 1 mm.

Description of the biotope of *I. ellenae*

The biotope of *I. ellenae* is located in a small side valley on the east slope of the deep canyon of the Mekong (Lancang Jiang) river. This valley, at an altitude of about 3000 m, is accessible after driving 20 km from the town of De-quin (the former A-tun-tse). The road climbs to approximately 800 m above the river. The mountain ridges on both sides of the canyon are at an altitude of more than 5000 m, with the highest peak Meili Xue Shan (6809 m) situated directly on the opposite side of the river. The slopes are very steep (at least 60°) and form an almost 3000 m deep canyon that is very impressive with the large glacier on Meili Xue Shan in the background.

This side valley turns to the east and is therefore isolated, but the climate corresponds with the altitude. The weather is influenced by the vicinity of the glacier but also by warm air coming from the south along the river. This part of the Mekong valley is notorious for its heavy rainfalls. Sunny days are hot and dry but the nights are cold. Winter temperature is usually some degrees above

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zero during the day and below zero during the night. In winter the precipitation is less than in summer.

A footpath leads into the side valley along the small river that is a tributary of the Mekong; here there are rural homesteads with gardens in the lower part near an asphalt road. These gardens are partly wild and turn into scrub and hardwood forest higher up where bushes of a wild *Rosa* species are abundant. Herbaceous vegetation is sparse. The biotope of *I. ellenae* is where the *Rosa* scrub grows along the path and in the gardens (Fig. 10).

During the visits by J. Klír (4. vi. and 6. vi. 2007), the weather was somewhat cloudy. At first one moth was observed flying and then a lot of individuals were found at rest. All were fresh (Fig. 8) so that it is probable that the flight period was just beginning. ♂♂, ♀♀ and copulating pairs were located sitting on twigs in the shade (Fig. 9) or on the undersides of leaves; when disturbed the moths would fly to another *Rosa* bush. When the sun hid behind the clouds, the ♂♂ would start to fly around the bushes, but if the sun appeared again, they immediately ceased flying. Some ♂♂ were observed nectaring at yellow-flowering herbs; none was observed resting on other bushes except *Rosa*. Unfortunately no ovipositing ♀♀ were observed, perhaps because it was at the very beginning of the flight period. Nevertheless, this wild *Rosa*, though without flowers, was highly attractive to moths of both sexes and therefore is most probably the larval host-plant of *I. ellenae*.

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Reference

Alberti, B. (1954): Über die stammesgeschichtliche Gliederung der Zygaenidae nebst Revision einiger Gruppen (Insecta, Lepidoptera). – Mitteilungen aus dem Zoologischen Museum der Humboldt-Universität Berlin, **30:** 115–480.

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